Sampson 1873-1946

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Introduction

John Albertson Sampson (August 17, 1873–December 23, 1946) was born near Troy, New York and graduated from Johns Hopkins in 1899. He remained at Johns Hopkins for residency with Drs. Howard Kelly and Thomas Cullen. After completing his residency in gynecology in 1904, he moved to Albany, New York. He began his career in private practice at the Albany Hospital and later became Professor of Gynecology at the Albany Medical College in 1911.
https://www.researchgate.net/publication/341606942
http://en.wikipedia.org/wiki/John_A._Sampson

Sampson published theories as least as early as 1921. In addition to his concepts of retrograde dissemination, he discussed vascular dissemination, lymphatic dissemination, transplantation endometriosis, differentiation of celomic (*coelomic*) epithelium, transition from normal endometrium to endometriotic tissue, an inflammatory reaction like cancer, direct extension from perforating ovaries, tubal epithelium as the origin, metaplasia of peritoneal epithelium due to the stimulus of menstrual blood from perforating ovaries, metaplasia of the mesothelial lining of the processus vaginalis peritoneii or of the endothelial lining of dilated vessels, extraperitoneal endometriosis remnants from Wolffian bodies, developmentally misplaced endometrial (Müllerian) tissue, and why endometriosis was a better designation than Müllerianosis.

In 1940, he reviewed his focused approach to surgical documentation of endometriosis. Then, he concluded that theory is of secondary importance and emphasized the acquisition of knowledge, the care of patients, and the need to resolve the unsolved problems of endometriosis.

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Retrograde vs Venous Dissemination 1927

The distinction of two of Sampson's papers in 1927 is important to those citing Sampson as Sampson's highly referenced retrograde theory paper is in the Am J Obstet Gynecol and is not listed in PubMed. A search for it in PubMed generally gets sent to the venous dissemination paper in the Am J Pathol which is a PMC. It is easy to reference the wrong paper if you rely on PubMed.

Sampson's 1927a Am J Obstet Gynecol (AJOG) reference is to menstrual dissemination into the peritoneal cavity. This is not his first reference to retrograde origin. The first is likely in in the 1921 perforating hemorrhage article in the Transactions of the American Gynecological Society version that is discussed at the section "Sampson, 1921 perforating hemorrhagic (chocolate) cysts" in this manuscript.

His 1927b Am J Pathol (AJP) reference is to vascular dissemination.

1927a dissemination into peritoneal cavity

Sampson JA. Peritoneal endometriosis due to the menstrual dissemination of endometrial tissue into the peritoneal cavity. Am J Obstet Gynecol. 1927, 14(4):422-469, doi: 10.1016/S0002-9378(15)30003-X.

There is also a Transactions of the American Gynecological Society version with discussion.

p 425 "The implantation theory does not account for all instances of ectopic endometrium-like tissue in the pelvis."

The "differentiation of celomic epithelium" is also a likely source.

p 463 Lesions include both "*typical endometrium with glands and stroma identical with that of the müllerian mucosa from which it came, and also dilated glands or cyst-like cavities lined by epithelium with very little or no characteristic endometrial stroma about it."*

p 466 "*both typical and atypical endometrial tissue was found and one could trace the transition of one type of lesion into the other.*"

The AJOG article also discusses metaplasia of peritoneal epithelium due to stimulus of menstrual blood and endometriosis of the uterine wall (adenomyosis).

1927b venous dissemination

Sampson. John A. Metastatic or embolic endometriosis, due to the menstrual dissemination of endometrial tissue into the venous circulation. Am J Pathol. 1927, 3(2): 93–110 and 22 plates. PMCID: PMC1931779, PMID: 19969738

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1931779/

Sampson discussed the use of extirpated uterine specimens to develop the data for his 1918 article on escape of foreign material from the uterine cavity into the uterine veins and how that expanded into this study demonstrating the dissemination of endometrial tissue.

NOTE: Earlier discussions of retrograde theory are in:

Sampson JA. Perforating hemorrhagic (Chocolate) cysts of the ovary: their importance and especially their relation to pelvic adenomas of the endometrial type ("adenomyoma" of the uterus, rectovaginal septum, sigmoid, etc.) Trans Am Gynecol Soc 1921, 46:162-241. Page 236.

Sampson JA. Endometriosis of the sac of a right inguinal hernia, associated with a pelvic peritoneal endometriosis and an endometrial cyst of the ovary. Am J Obstet Gynecol 1926, 12(4):459-483, doi: 10.1016/S0002-9378(15)30433-6.

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First published reference to "endometriosis"

Endometriosis was generally called adenomyoma before Sampson's work. He discussed "tissue of endometrial type lining the wall of the hematoma and also often in pockets in the ovary" in 1921.

Four or more published papers discussed "endometriosis" in 1925. Sampson published "*Inguinal endometriosis (often reported as endometrial tissue in the groin, adenomyoma in the groin, and adenomyoma of the round ligament*" in October. The following month Sampson, Jacobson, and Ewing used the term.

Sampson JA. Perforating hemorrhagic (chocolate) cysts of the ovary. Their importance and especially their relation to pelvic adenomas of the endometrial type ("adenomyoma" of the uterus, rectovaginal septum, sigmoid, etc.) Arch Surg (now JAMA Surgery). 1921, 3(2):245-323. doi: 10.1001/archsurg.1921.01110080003001
https://jamanetwork.com/journals/jamasurgery/fullarticle/536143

Sampson JA. Inguinal endometriosis (often reported as endometrial tissue in the groin, adenomyoma in the groin, and adenomyoma of the round ligament)*. Am J Obstet Gynecol 1925, 10(Oct)(4):462-503. doi: 10.1016/S0002-9378(25)90591-1. *Read (by invitation) at a meeting of the Philadelphia Obstetrical Society, March 5, 1925.

https://doi.org/10.1016/S0002-9378(25)90591-1
https://www.ajog.org/article/S0002-9378(25)90591-1/pdf

Sampson JA. Heterotopic or misplaced endometrial tissue. Am J Obstet Gynecol 1925, 10(Nov)(5):649-664. doi: 10.1016/S0002-9378(25)90629-1
https://doi.org/10.1016/S0002-9378(25)90629-1

Jacobson VC. Certain clinical and experimental aspects of ectopic endometriosis. Bulletin of the New York Academy of Medicine. 1925;1(Nov)(9):385. PMCID: PMC2387491
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2387491/
Note: Jacobson was a pathologist who worked with Sampson.

Ewing J. James Ewing discussed Sampson in the Society Transactions of the The American Gynecological Society, Fiftieth Annual Meeting, Washington, DC, May 4,5, and 6. 1925. Am J Obstet Gynecol 1925, 10(Nov)(5):730-738
DOI: https://doi.org/10.1016/S0002-9378(25)90643-6

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But Sampson credited "*Heterotopic or misplaced endometrial tissue*" as the first in 1928.

Sampson JA. Endometriosis following salpingectomy. Am J Obstet Gynecol 1928, 16(4):461-499. doi: 10.1016/S0002-9378(28)90534-7
https://doi.org/10.1016/S0002-9378(28)90534-7
https://www.ajog.org/article/S0002-9378(28)90534-7/fulltext

In 1925 Sampson, in "*Heterotopic or misplaced endometrial tissue,"* considered other related terms such as endometriosis Müllerianosis, endometrioma, and endometriomyoma that had been used as early as 1922. He concluded that müllerianosis would be inclusive but suggested an embryonic origin and was not as descriptive as endometriosis. He considered other terms such as endometrioma, müllerianoma, and endosalpingiosis.

"*The name, endometriosis, was used by me[1] to indicate conditions arising from both misplaced uterine and tubal mucosa. even though I realized that it was not strictly correct in the latter. At the time it was stated that müllerianosis would be an inclusive and a correct term. Unfortunately, it suggests an embryonic origin, does not specify its derivation from mucosa and is not as descriptive as endometriosis. Objections were made to the names, endometrioma and müllerianoma, given by Blair Bell[2] and Bailey[3] respectively, because it did not seem to me that. these lesions could be classified as true neoplasms. The invasion of the uterine wall by its mucosa is an excellent example of an endometriosis, but this name could not, correctly be applied to the conditions resulting from the invasion of the tubal wall by its mucosa. Endosalpingiosis would be correct in the latter. The same confusion arises in the nomenclature of the implantation-like lesions of müllerian mucosa involving the peritoneum, because there is strong circumstantial evidence indicating their origin from both uterine and tubal mucosa. In my earlier studies of peritoneal endometriosis. I thought that one could often determine whether given misplaced endometrium-like tissue was of uterine or tubal origin. If it had the histologic structure of the glandular elements of a direct endometriosis, it was of uterine*

origin; if that of a direct endosalpingiosis, it was of tubal origin. Later studies convinced me that misplaced endometrial tissue, at times, may simulate tubal mucosa and misplaced endosalpingeal tissue may simulate uterine mucosa, so that the source of the glandular elements in these lesions cannot with certainty be determined by their histologic structure.
1. Sampson, J. A.: Am. Jour. Obst. and Gynec., 1925, x, 649.
2. Blair-Bell Jour. Obst. and Gynec. Brit. Emp, 1922, xxix, 443.
3. Bailey, K. V.: K. P.: Jour. Obst. and Gynec., Brit. Emp, 1924, xxxi, 539."
Sampson JA. Heterotopic or misplaced endometrial tissue. Am J Obstet Gynecol 1925, 10(Nov)(5):649-664. doi: 10.1016/S0002-9378(25)90629-1.
*Read (by invitation) at a meeting of the Philadelphia Obstetrical Society, March 5, 1925.
https://doi.org/10.1016/S0002-9378(25)90629-1

Bell WB. Endometrioma and Endometriomyoma of the ovary. J Obstet Gynaecol Brit Emp 1922, xxix:443–446.1 with three plates
https://babel.hathitrust.org/cgi/pt?id=uc1.$b330790&view=1up&seq=475

Bailey KV. The etiology, classification, and life history of tumors of the ovary and other female pelvic organs containing aberrant müllerian elements, with suggested nomenclature. J Obstet Gynaecol Brit Emp 1924, xxxi:539-579 and plates 522.1-522.25
https://babel.hathitrust.org/cgi/pt?id=uc1.$b330792&view=1up&seq=661

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First to publish a description of the disease

The first to publish a description of endometriosis is a matter of debate. "*The History of Endometriosis*" by Drs. Benagiano, Brosens, and Lippi in 2014 is followed by invited comment by Dr. Batt. Dr. Benagiano credits Cullen as the first to delineate peritoneal endometriosis under the name 'adenomyoma.' Dr. Batt credits von Rokitansky.

Benagiano G, Brosens I, Lippi D. The history of endometriosis. Gynecol Obstet Invest. 2014, 78(1):1-9. PMID: 24853333, doi: 10.1159/000358919

Batt RE. Invited comment on the paper by Benagiano et al. entitled 'The History of Endometriosis'. Gynecol Obstet Invest 2014, 78(1):10–11. PMID: 24852261, doi: 10.1159/000362331

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Atypical endometrial tissue and metaplasia

Sampson JA. Arch Surg (JAMA Surgery). 1921, 3(2):245-323

Page 259 "*The epithelial portion of the cyst strongly suggests misplaced atypical endometrial tissue both in structure and in function*."

Page 257 "*If these cysts are of endometrial type and if their epithelial lining arises from the invasion of the surface epithelium of the ovary through the place of rupture, we must conclude that a metaplasia of the epithelium occurs, by which it may not only assume the histologic picture of endometrial tissue but may even function as such*."

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Increased Recognition

Sampson 1940, p553: "As a result of greater ability in recognizing the lesions of peritoneal endometriosis at operation, 33 cases of this condition associated with endometrial cysts of the ovary were encountered in one year, as compared with 23 similar cases which had been previously collected over a period of more than ten years."

Thus, Dr. Sampson increased from 2.3 yearly to 33 yearly.

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Transactions of the American Gynecological Society

Sampson often presented his work at the meetings of the American Gynecological Society. Some of his publications in journals including American Journal of Obstetrics and Diseases of Women and Children, American Journal of Obstetrics and Gynecology, and Archives of Surgery (now JAMA Surgery) were duplicated in the Transactions of the American Gynecological Society. The Transactions versions commonly have additional or modified discussion from Sampson and others at the meetings.

An interesting addition in the Transaction version of "Perforating hemorrhagic (Chocolate) cysts of the ovary: their importance and especially their relation to pelvic adenomas of the endometrial type ("adenomyoma" of the uterus, rectovaginal septum, sigmoid, etc.)" was likely Samson's first comment on retrograde theory "*Two possible sources of the origin of these small tubules or cysts of endometrial type in the ovary present themselves: first, congenital, and second, acquired from the implantation of epithelium escaping from the tube during menstruation and its subsequent invasion of the ovary.*"

Sampson JA. Perforating hemorrhagic (Chocolate) cysts of the ovary: their importance and especially their relation to pelvic adenomas of the endometrial type ("adenomyoma" of the uterus, rectovaginal septum, sigmoid, etc.) Trans Am Gynecol Soc 1921;46:162-241.
Transactions of the American Gynecological Society 1921: https://www.google.com/books/edition/Transactions_of_the_American_Gynecologic/QqFEAAAAYAAJ?hl=en&gbpv=1
The origin comment is on page 236, second paragraph.

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Samson's first comment on retrograde theory

The Transactions of the American Gynecological Society version of perforating hemorrhagic (chocolate) cysts of the ovary: their importance and especially their relation to pelvic adenomas of the endometrial type ("adenomyoma" of the uterus, rectovaginal septum, sigmoid, etc.) is likely Samson's first comment on retrograde theory "*Two possible sources of the origin of these small tubules or cysts of endometrial type in the ovary present themselves: first, congenital, and second, acquired from the implantation of epithelium escaping from the tube during menstruation and its subsequent invasion of the ovary.*"

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More than one theory

Sampson considered retrograde menstrual as a source, not the source of endometriosis.

In 1921, Sampson discussed congenital and acquired theories of endometriomas. (Arch Surg.1921, 3(2):245-323)

In 1940, he discussed implantation, metaplasia, congenitally misplaced epithelium, derivation from tubal or uterine mucosa, secondary spread, and the similarity of some forms of endometriosis with adenomyosis. (Am J Obstet Gynecol. 1940, 40(4):549-557)

Between 1921 and 1940, he discussed twelve or more theories including retrograde dissemination, vascular dissemination, lymphatic dissemination, transplantation endometriosis, differentiation of celomic (*coelomic*) epithelium, direct extension from perforating ovaries, tubal epithelium as the origin, metaplasia of peritoneal epithelium due to the stimulus of menstrual blood from perforating ovaries, metaplasia of the mesothelial lining of the processus vaginalis peritoneii or of the endothelial lining of dilated vessels, extraperitoneal endometriosis remnants from Wolffian bodies, developmentally misplaced endometrial (Müllerian) tissue, similarities of some forms of endometriosis with adenomyosis, and why endometriosis was a better designation than Müllerianosis.

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Theories before Sampson

A review of older theories is in Russell (1899) who considered remnants of the germinal epithelium (Waldeyer, 1870), extension of tubal epithelium (Marchand, 1879), Wolffian body, and Müller's duct remnant.

Russell WW. Aberrant portions of the Müllerian duct found in an ovary: Johns Hopkins Hospital Bulletin, 1899, 10:8-10 plus plates.

NOTE: A search for Russell in PubMed, links to Longo (Am J Obstet Gynecol 1979, 134(2):225-226) who reviewed Russell and other articles.

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Müllerianosis vs. Mülleriosis

Dr. Jordan Phillips, president of the AAGL asked Dr. Ron Batt to be the keynote lecturer on endometriosis at the First Chinese International Congress on Obstetrics and Gynecology in Beijing in 1985. At that time, Dr. Batt described two types of endometriosis; the congenital and acquired forms. He viewed the histogenesis of endometriosis as a continuum starting with cases of congenital endometriosis originating in embryonic life, followed by cases of acquired endometriosis originating from the endometrium. This was subsequently refined and presented as "Duplications of the Müllerian System and Pelvic Endometriosis." First World Congress on Endometriosis, Clermont-Ferrand, France, 1986 and published in 1989 as "Embryologic Theory of the Histogenesis of Endometriosis in Peritoneal Pockets." This was further refined and his 2013 publication and his presentation to the Endometriosis Foundation of America (EFA) in 2015 when he received the EFA clinical award. Dr. Batt concluded that there are four forms of acquired in four forms of Müllerian diseases and four forms of congenital Müllerianosis. Those are adenomyosis, endometriosis, endosalpingiosis, and endocervicosis. The references are in the related references section of this file.

Parallel to this, Dr. David Redwine developed a theory of Mülleriosis which consider that all endometriosis with congenital and all of the transitional characteristics seen in the transition from an early Müllerian remnant to advanced endometriosis were related to the site of the cell of origin. He does not consider that Müllerian remnants and endometriosis are both Müllerian and has a selective use of his source citations. He and I [DCM] have disagreed about this since the 1980s. The first published disagreement was in 1990.

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Joseph Meigs and John Sampson

Joseph V. Meigs was 30 year of age and Sampson 48 when Sampson spoke to the Harvard Medical Society at the Peter Bent Brigham Hospital, Boston February 14, 1922. Meigs (1922) credited Sampson for a theory of implantation. Sampson responded in 1925 by crediting Pick (1905) and Rokitansky (1861) with discovering the disease.

Meigs JV. Endometrial hematomas of the ovary. Boston Med Surg J. 1922, 187:1-13. doi: 10.1056/NEJM192207061870101

Sampson JA. Heterotopic or misplaced endometrial tissue. Am J Obstet Gynecol 1925, doi: 10(5):649-664. doi: 10.1016/S0002-9378(25)90629-1.

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A History of Endometriosis, Ron Batt, 2011

Batt RE. A History of Endometriosis. Springer-Verlag London Ltd., London, 2011.
https://www.google.com/books/edition/A_History_of_Endometriosis/JyoywyVfIhkC?hl=en&gbpv=0
https://www.springer.com/us/book/9780857295842

Dr. Batt's *A History of Endometriosis* includes three chapters on Sampson's work. There are jewels that include Samson's first comment on retrograde theory "*Two possible sources of the origin of these small tubules or cysts of endometrial type in the ovary present themselves: first, congenital, and second, acquired from the implantation of epithelium escaping from the tube during menstruation and its subsequent invasion of the ovary.*"

He also discusses the likelihood that DeWitt Casler's case of the externally menstruating ovary inspired Sampson's theory.

Casler DB. A unique diffuse uterine tumor, really an adenomyoma, with stroma, but no glands. Menstruation after complete hysterectomy due to uterine mucosa in remaining ovary. Trans Am Gynecol Soc. 1919, 44:69-84 and 15 plates.

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SAMPSON REFERENCES (Chronologic)

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Sampson 1905 ureteral surgery

Sampson JA. IV. Operations on the lower ends of the ureters by the inguinal extraperitoneal route under local anaesthesia (cocaine): A report of three ureterovesical implantations and the removal of a ureteral calculus. Ann Surg. 1905, 41(2):216-41. doi: 10.1097/00000658-190502000-00004. PMID: 17861597; PMCID: PMC1425798.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1425798/

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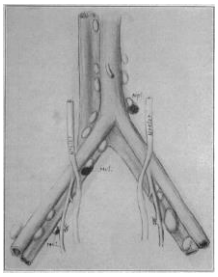
Sampson 1911 pelvic lymphatics in uterine cancer

Sampson JA. The participation of the tissues adjacent to the uterus and of the pelvic lymphatics in uterine cancer. JAMA. 1911, 66(2):101-9. doi: 10.1001/jama.1911.02560020017006 https://jamanetwork.com/journals/jama/fullarticle/435240

Metastases to the lymphatic structures from cervical cancer are frequent occurrences. Metastases to structures other than lymph-nodes are very unusual.

Figure 19



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Sampson 1918 escape into uterine veins

Duplicate publication in AJODWC & Trans Am Gynecol Soc

Additional notes at *Sampson 1918 escape into uterine veins*

Sampson JA. The escape of foreign material from the uterine cavity into the uterine veins. Am J Obstet and Diseases of Women and Children 1918, 78:161-175; Discussion 1918, 78:290-191

Sampson JA. The escape of foreign material from the uterine cavity into the uterine veins. Trans Am Gynecol Soc, 43:16-26 and 9 plates (includes discussion)

The discussion on pages 290-291 of the AJODWC version is expanded in Transactions of the American Gynecological Society pages 2-26.

American Journal Obstetrics and Diseases of Women Children, Volume 78, 1918, is at HathiTrust: https://babel.hathitrust.org/cgi/pt?id=uc1.b4778320&view=1up&seq=171

Transactions of the American Gynecological Society 1918 is at Google Books: www.google.com/books/edition/_/WSY4AQAAMAAJ?hl=en

"*Foreign material (bismuth or barium in suspension) can often be easily forced from the cavity of the uterus (removed at operation) into the uterine veins if the endometrium is injured or has been removed by curettage. A study of the uterus in which the veins have been injected demonstrates large "receiving sinuses" radiating from the base of the endometrium into the myometrium. If these sinuses are exposed by removing the overlying endometrium and the uterus is relaxed, thus holding the lumina of the sinuses open, fluid and small solid material could easily escape from the uterine cavity into them when the pressure in the uterine cavity is greater than that in the sinuses. Uterine contraction following relaxation when there is obstruction in the cervical canal and intrauterine irrigation may bring about this increased pressure. This explains one way by which puerperal infection may result and placental cells may gain access to the veins outside of the uterus*."

A uterus was removed at operation or autopsy and injected with melted gelatine that was allowed to solidify. Then stereoscopic X-rays were taken. The melted gelatine could escape into the tubes if the latter were patent and can be seen on X-ray (Figs 1 and 2). The melted gelatine filled the veins creating a venogram effect. (Figs 3, 5, 6, 7)

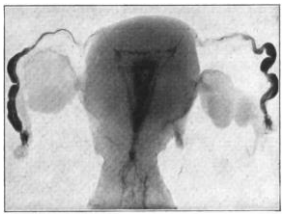
Flow of a gelatine mass through the tubes explains one way in which salpingitis and peritonitis may occur, both puerperal and especially that due to gonorrheal infection. If fluid containing bacteria within the uterine cavity, as infected menstrual blood, was in any way prevented from readily escaping through the cervix it might be forced back into the tubes, causing salpingitis and pelvic peritonitis.

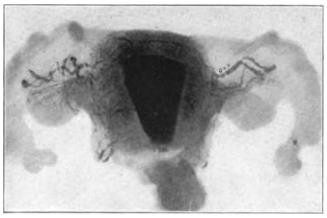
The occurrence of bacteria in the circulating blood in puerperal infection, the presence of chorioepithelioma in the veins about the uterus, the metastases of chorioepithelioma to the lungs, and the finding of giant cells (placental)) in the pulmonary capillaries of puerperal women dying of other diseases, demonstrates that in some way these foreign bodies escape from the uterus into the venous circulation.

The uterine veins in younger women with inflammatory diseases are larger and had more escape of material.

"*We must recognize two uterine cavities, the uterine cavity proper and the venous cavity. When the uterus is relaxed the venous cavity is filled with blood, when it contracts this blood is forced out of the uterus into the uterine veins*."

Figure 1 Figure 6





Sampson's figures 3, 5, 6, and 7 look like a hysterosalpingogram (HSG) venogram appearance. Lymphatics can also be seen on HSG.
Hunt RB, Siegler AM, editors. Hysterosalpingography: Techniques and interpretation. Chicago: Medical Publishers, Inc.; 1990.

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Sampson, 1921 perforating hemorrhagic (chocolate) cysts

Near duplicate in Arch Surg & Trans Am Gynecol Soc

Sampson JA. Perforating hemorrhagic (chocolate) cysts of the ovary. Their importance and especially their relation to pelvic adenomas of the endometrial type ("adenomyoma" of the uterus, rectovaginal septum, sigmoid, etc.) Arch Surg (now JAMA Surgery). 1921, 3(2):245-323. doi: 10.1001/archsurg.1921.01110080003001

https://jamanetwork.com/journals/jamasurgery/fullarticle/536143

A near duplicate with additional notes and comments on pages 235-241 is:
Sampson JA. Perforating hemorrhagic (chocolate) cysts of the ovary: their importance and especially their relation to pelvic adenomas of the endometrial type ("adenomyoma" of the uterus, rectovaginal septum, sigmoid, etc.) Trans Am Gynecol Soc 1921;46:162-241.

The 1921 Transactions of the American Gynecological Society issues are at Google Books: https://www.google.com/books/edition/Transactions_of_the_American_Gynecologic/QqFEAAAAYAAJ?hl=en&gbpv=1

The Transaction version, page 236, includes Sampson's possible first description of *"epithelium escaping from the tube during menstruation."*

"*Two possible sources of the origin of these small tubules or cysts of endometrial type in the ovary present themselves: first, congenital, and second, acquired from the implantation of epithelium escaping from the tube during menstruation and its subsequent invasion of the ovary.*"

Trans Am Gynecol Soc Page 236: https://www.google.com/books/edition/Transactions_of_the_American_Gynecologic/QqFEAAAAYAAJ?hl=en&gbpv=1&bsq=%22Two%20possible%20sources%20of%20the%20origin%22

Sampson references Smith (1920), Savage (1906), Wolf (1908), and Hedley (1910) as describing ovarian hematomas compatible with what would be called endometriosis.

Uses 'adenomas of endometrial type' and 'endometrial tissue' not 'endometriosis.'

p245 "*hemorrhagic (chocolate) cysts*" "*hemorrhagic ovarian cyst or ovarian hematoma*

p247 "*The variation in size of the cysts, with the varying extent and denseness of the adhesions, leads to mistakes in diagnosis both before and during the operation. The smaller cysts with slight or moderate adhesions may be mistaken for pelvic inflammatory disease of tubal origin; the larger cysts with dense adhesions for malignant ovarian cysts and the dense adhesions in the culdesac for the implantation of cancer, or, when the rectal wall is extensively involved, for rectal cancer."*

p247 "*adenoma of endometrial type"*

p249-250 Partial (incomplete) resection "successful" "*The anterior rectal wall felt so indurated after the removal of the uterus that I thought the patient might have a malignant growth of the rectum. I made a digital rectal examination before the patient left the operating room. While the induration in the anterior rectal wall could be distinctly detected, the rectal mucosa over it felt normal. The patient developed a postoperative ileus which was relieved by an enterostomy. She eventually recovered and has never had any trouble from the rectal condition."*

p250 Increased recognition "*It was only after I had removed other similar cysts that I began to recognize that the adhesions accompanying these cysts arose from the escape of their hemorrhagic contents into the peritoneal cavity. I have since been impressed with the fact that the diagnosis of such a definite clinical and pathologic entity should be made before the operation.*"

p250 *The association between these cysts and "adenomyomas" of the posterior uterine wall with adhesions between it and the rectum was first observed by me, in 1912. March 27 of that year, I removed an "adenomyomatous" uterus in which the "adenomyoma" had apparently extended through the posterior uterine wall and had invaded the anterior wall of the rectum (Fig. 64, Case 2).*

p250 *I did not observe another similar condition until June 13, 1918* Increased recognition " *(Case 6), but I undoubtedly had overlooked many.*

p251 *From May 1, 1920, until May 1, 1921, I have operated on fourteen patients with these cysts, and in ten, an adenoma of the endometrial type was found in the organs or tissues which were adherent. In the four in which it was not found, the adhesions were slight, conservative surgery was performed and tissue was not removed from the adherent structures for microscopic examination.*

p256

Casler (1919) *"reported an unusual case in which a patient menstruated through the vagina after a conservative hysterectomy in which one ovary was saved. The uterus was removed for an "adenomyoma" which contained stroma but no glands. At the second operation, four years later, the enlarged ovary was removed and it was found to contain cavities lined by "normal uterine mucosa."*

[[[Casler DB. A unique, diffuse uterine tumor, really an adenomyoma, with stroma, but no glands. Menstruation after complete hysterectomy due to uterine mucosa in remaining ovary, Trans Am Gynecol Soc. 1919, 44:69-84 and 15 plates. https://www.google.com/books/edition/Transactions_of_the_American_Gynecologic/SaBEAAAAYAAJ?hl=en&gbpv=0]]]

p256 Contrasted '*normal endometrium*' with '*ectopic endometrium*.'

p259 "*The epithelial portion of the cyst strongly suggests misplaced atypical endometrial tissue both in structure and in function.*"

p267 "*Of the twenty-three cases reported in this paper, pelvic adenoma of endometrial type was found in thirteen. In the remaining ten it was not found. I believe it might have been found in many, and possibly in all, of these ten cases had the tissue involved in the adhesions been carefully studied. It was examined microscopically in only one of these, and in that one not thoroughly enough to exclude adenoma*.

p277 (pockets in ovary) *These spaces of endometrial type could be interpreted as the remains of an "endometrial" hematoma in which nearly complete retrogression had occurred or "endometrial" pockets or clefts which had functioned, namely, had menstruated, and the secondary pelvic adenomas had arisen from them. From my studies, I am inclined to consider them possibly as either one or the other of these. It is also possible that their origin was independent of the ovaries. In not a single instance of the twenty-three cases reported in this paper was there any gross evidence of a recent or an old inflammatory disease of tubal origin; the fimbriated extremities of the tubes in all cases appeared normal and whatever adhesions were present about the tubes were of extratubal origin, that is, from the contents of the cyst.*

p280-281 *they are apparently rare in women who have had salpingitis, a common condition in women over 30 years of age and also a common cause of sterility.*

p284 *Eight of the twenty-three patients did not have pain as a leading symptom. In three of these the adhesions were very extensive. Fifteen, however, did have pain. In three of these, the pain was probably due to trouble with the appendix· In the*

other twelve cases, the adhesions resulting from the ovarian cysts or cyst were the apparent cause of the pain.

p288 *To remove the pelvic adenoma and disregard the ovarian condition would be to leave the original growth behind, and furthermore, the persistence of the ovarian function might increase the growth of secondary pelvic adenomas not removed. Certainly we would not sanction the surgical judgment of the operator who removed the secondary peritoneal implantations of ovarian papilloma or cancer and did not remove the primary ovarian tumor.*

p290 Partial (incomplete) resection "*In one instance (Case 19), I removed the entire uterus, both tubes and ovaries, a portion of the sigmoid; and in this case, adenoma was undoubtedly left in the anterior wall of the rectum and a distinct nodule in a portion of the sigmoid was not removed. I am anxiously awaiting the end-result in this case. So far she has been completely relieved and feels perfectly well.*"

p291 "*I am inclined to believe that ovarian conservatism is a rather dangerous experiment. In all other cases, either when ovarian conservation is not strongly desired or when the pelvic growth is apparently actually invasive, I believe that all ovarian tissues should be removed and as much as possible of the pelvic growth with it. We must not lose sight of one fact, and that is that for many years we have been operating on these patients without realizing the exact nature of the disease. On the whole, the results have usually been quite satisfactory because the growth is usually only mildly invasive. With a better knowledge of this subject and by following up our cases, we should soon be able to determine the proper treatment of this condition*."

p292 Partial (incomplete) resection "*The 'adenomyoma' had 'extended through' the uterine wall posteriorly and apparently had actually invaded the anterior wall of the rectum (Fig. 64). In freeing the uterus from the rectum, some of the growth was probably left attached to, or in, the rectal wall. The patient made a satisfactory convalescence and has remained well even though it is doubtful whether all the adenomatous tissue was removed at operation.*"

p314 Fig. 68 *hemorrhagic peritoneal "blebs" (adenomatous)*

p323 "*In two patients operated on at the time of the menstrual period, one the day that menstruation was due (Case 13, Fig. 29), and the other the last day of menstruation (Case 19, Fig. 57), the histologic changes in the ovarian "endometrial" tissue corresponded to the phase of the menstrual cycle indicated by the menstrual history of the patient.*"

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Blebs, Lack of correlation, *10 of 14 adhesions were positive* (page 267), Treatment by castration, No hydrosalpinges, Myomata in 10 of 23 patients.

Twenty-three case reports with 9(?) true endometriomas, 6(?) corpus luteum with endometriosis at the margin (perforation site) and 6(?) with no histology. (Review & clarify 21 or 23 cases) The "*perforation site*" endometriosis may have been overlying a corpus luteum when it was ruptured surgically.

Dilated gland or bleb p 268 (Fig 22)

Hemorrhagic blebs, pages 314, 316

Adenomyomata

- Noted in 1912, p 250
- Rectovaginal septum, p 248
- Vagina, p 249
- Rectum, p 249

Adhesions, p 262, 264, 322, 265

Blood causing adhesions, p 265

Cyst are usually between 2 and 4 cm in diameter, p 319

Lack of correlation, p 284

Hemorrhagic cysts may rupture into a cystic follicle, p 254-263 (Figure 17)

10 (72%) of 14 adherent rectal lesions were positive, p 267

"During the last year, I have examined microscopically all tissue involved in these adhesions except when conservative work was done. Adenoma of the endometrial type was found in this tissue in ten of the fourteen patients with perforating hemorrhagic cysts of the ovary"

Growth and regression, p 262

Coincidental staph, p 265

Bowel resection with end to end suture, p 273

Treatment by castration, p 274, 287, 290

Histology in phase, p 275, 323

Adenomyomata, p 276

- Adenomyosis (internal)
- Adenomyoma (external)

Age 26 to 47, p 279

- 9 of 15 married patients pregnant
- 3 of 16 with more than 1 child

Constipation, p 285

Rectal p280

No hydrosalpinges, p 281

Myomata in 10 of 23 patients, p 281

Early publications include Cullen, 1896; Russell, 1899; Lockyer, 1913; Sampson, 1918; Cullen, 1919; Cullen, 1920; Sampson, 1921; and Sampson, 1922.

Has reference to Runge 1903 and Wolf 1908 on invagination in ovaries. See Hughesdon 1973 #76

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From Batt dissertation p 326 - By 1921, Sampson had developed his first theory of pathogenesis of pelvic adenomas and associated adhesive disease; both resulted from chocolate fluid containing endometrial issue that spilled into the pelvis from ruptured hemorrhagic ovarian cysts.

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From Batt dissertation p 320 & 323 - "*Of physiologic interest, it is to be noted that the adenoma of endometrial type developing in the ovary and arising in the portion of the pelvis as the result of the escape of the hemorrhagic contents of the ovary may be the seat of periodic hemorrhages, i. e., they may be 'menstruating organs*."

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From Batt dissertation p 323 - "*Casler, in 1919, reported an unusual case in which a patient menstruated through the*

vagina after a conservative hysterectomy in which one ovary was saved…at the second operation, four years later, the enlarged ovary was removed, and it was found to contain cavities lined by "normal uterine mucosa."

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From Batt dissertation p 326 - Sampson used the terms "*tissue of endometrial type*" and "*endometrial tissue*" in place of Cullen's term "*uterine mucosa*." This was the first time that Sampson used the term "*endometrial tissue*."

Sampson 1921 Arch Surg, p 247-248: "*Of histologic and pathologic interest is the finding in these ovaries of tissue of endometrial type lining the wall of the hematoma and also often in pockets in the ovary especially about the site of perforation*."

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From Batt dissertation p 327 - "*If these cysts are of endometrial type and if their epithelial lining arises from the invasion of the surface epithelium of the ovary through the place of rupture, we must conclude that a metaplasia of the epithelium occurs, by which it may not only assume the histologic picture of endometrial tissue but may even function as such*."

Sampson JA. Perforating hemorrhagic (chocolate) cysts of the ovary. Archives of Surgery 1921;3:245-323:257. P 257

Page 312 "*Without reference to the serosal metaplasia theory of Iwanoff or the peritoneal metaplasia theory of Meyer, Sampson seems to have tentatively accepted metaplasia of the ovarian surface cells as the pathogenesis of perforating hemorrhagic cysts of the ovary*."

"*Iwanoff published his theory that glandular cystic spaces in fibromyomas originated by an ingrowth of overlying serosa*."

Iwanoff, N.S. (1898) Drusiges cysthaltiges Uterusfibromyom compliziert durch Sarcom und Carcinom (Adenofibromyoma cysticum arcomatodes carcinomatosum). Monatsc fur Geburtsh und Gyndkol, 7, 295-300.

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Sampson, 1922 hematomas of endometrial type

Sampson, JA. Ovarian hematomas of endometrial type (perforating hemorrhagic cysts of the ovary) and implantation adenomas of endometrial type. Boston Medical and Surgical Journal 1922;186:445-56.

Duplicate publication in Am J Obstet Gynecol & Trans Am Gynecol Soc

From Batt dissertation p 149-150.

Sampson wrote, without direct citation, "*In 1894, Pilliet took the view that the cysts and glands of adenomyoma were of mucosal origin*."

Sampson casually inserted an observation that anticipated by two years Josef Halban's theory of lymphatic dissemination of adenomatous tissue.

From Batt dissertation p 336

"*Adenoma is sometimes found invading the lymph vessels from these implantations [of adenomas of endometrial type], and metastases may occur from this source and explain the origin of similar growths found in the groin. I have seen a similar invasion of a lymph vessel in a primary 'adenomyoma' of the tube and believe that they also may occur in primary 'adenomyoma' of the uterus*."

Sampson JA. Ovarian hematomas of endometrial type (perforating hemorrhagic cysts of the ovary) and implantation adenomas of endometrial type. Boston Med Surg J 1922, 186:445-456:448.

Re: Halban J. Hysteroadenosis metastatica. (Die lymphogene Genese der sog. Adenofibromatosis heterotopica.) Wiener klinische Wochenschrift 1924;37:1205-6.

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Sampson 1922 intestinal adenomas endometrial type

Sampson JA. Intestinal adenomas of endometrial type: Their importance and their relation to ovarian hematomas of endometrial type (perforating hemorrhagic cysts of the ovary). Arch Surg (now JAMA Surgery). 1922, 5(2):217-280. DOI: 10.1001/archsurg.1922.01110140003001
DOI: https://doi.org/10.1001/archsurg.1922.01110140003001
https://jamanetwork.com/journals/jamasurgery/fullarticle/536342

Duplicate publication in Am J Obstet Gynecol & Trans Am Gynecol Soc

"*During the last six operative months, I have encountered nineteen cases of perforating hemorrhagic cysts of the ovary in my practice. The amount of my operative work has not increased and I do not believe the frequency of this condition has; but I am better able to recognize it, both during the operation and in the systematic study of the specimens afterward*."

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Sampson 1922 life history ovarian hematomas

Duplicate publication in Am J Obstet Gynecol & Trans Am Gynecol Soc

Sampson JA. The life history of ovarian hematomas (hemorrhagic cysts) of endometrial (Müllerian) type. Am J Obstet Gynecol 1922, 4(5):451-512. doi: 10.1016/S0002-9378(15)33061-1
https://www.ajog.org/article/S0002-9378(15)33061-1/fulltext
https://doi.org/10.1016/S0002-9378(15)33061-1

Also in Transactions of the American Gynecological Society.

Sampson JA. The life history of ovarian hematomas (hemorrhagic cysts) of endometrial (Müllerian) type. Trans Am Gynecol Soc. 1922, 47:56-119 and six plates

Transactions of the American Gynecologic 1922.
https://www.google.com/books/edition/Transactions_of_the_American_Gynecologic/Uyg4AQAAMAAJ?hl=en&gbpv=0

Thirty-seven cases in 170 abdominal operations for pelvic disease in women 35 to 50 years of age, three <30 years of age and three >50.

"*The epithelium primarily giving rise to these implantations is derived from or through the fimbriated ends of the fallopian tubes.*"

"*The primary peritoneal implantation adenomas are usually small and insignificant but may spread and become invasive*."

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Sampson 1924 benign and malignant endometrial implants

Sampson JA: Benign and malignant endometrial implants in the peritoneal cavity, and their relation to certain ovarian tumors. Surg Gynecol Obstet 1924, 38(3):287-311. https://babel.hathitrust.org/cgi/pt?id=uva.x002486984&view=1up&seq=314

Page 287 Red raspberries, purple raspberries and blueberries raspberries.

Page 288 implantation adenomyomata of the endometrial type (endometrial implants)

P 288. Fig. 2. (A. H. No. 89183.) Endometrial implants on the suspensory ligament of the left ovary, a, on the broad ligament near the uterine attachment of the left uterosacral ligament, b, and on the right uterosacral ligament, c (X3/5)- The patient's age was 33 years. She had never had any children, but had a miscarriage 9 years ago. Operation was on the first day of the menstrual period. The uterus was retroflexed and contained several small leiomyomata. The implants (a and c) are superficial, similar, and apparently of the same age. Implant b is apparently older (thus representing an earlier implantation) and had invaded the underlying tissue. The distribution of the implants suggests a common origin. Epithelium escaping through the tubes could have caused them. For the appearance of and the histological structure of the implant a, see Figures 3 and 4.

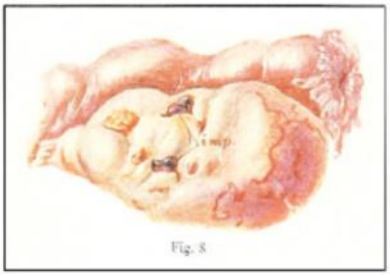
Page 289 Pigmentation due to hemorrhage (menstruation) is nearly always present in the tissues of these implants.

Page 289 The primary peritoneal implants are usually small and are easily overlooked by the operator was not familiar with them.

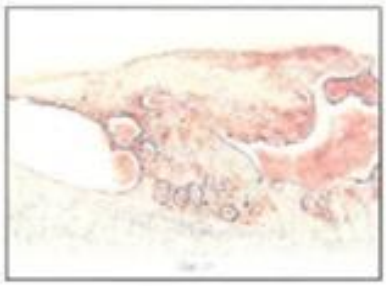
Page 289 Perforation often occurs in the superficial hemorrhagic cyst while they are still small, a few millimeters in diameter.

287b Illustrations of blebs on Plate 1, Figs 4 (hemorrhagic) and 8 (hemorrhagic & clear)

287b Plate 1, Fig 4

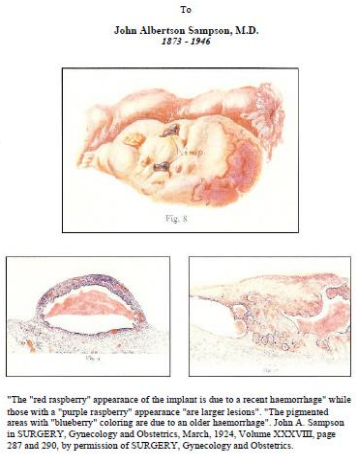


287b Plate 1, Fig 8



290b Plate 2, Fig 17

Those were used in the dedication to LAE Color Atlas 1990



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Sampson 1925a inguinal endometriosis

Sampson JA. Inguinal endometriosis (often reported as endometrial tissue in the groin, adenomyoma in the groin, and adenomyoma of the round ligament. Am J Obstet Gynecol 1925, 10(Oct)(4):462-503. doi: 10.1016/S0002-9378(25)90591-1.
https://doi.org/10.1016/S0002-9378(25)90591-1
https://www.ajog.org/article/S0002-9378(25)90591-1/pdf

Endometrium-like tissue can be divided into three groups: endometrial, non-Müllerian, and undetermined.

Inguinal endometriosis may be secondary to that in the pelvis and, if so, that it may arise from:

1. Metastasis through lymph vessels invaded by endometrial tissue implanted about the uterine end of the round ligament and the broad ligament.

2. A direct extension or metastasis along the round ligament from a peritoneal endometriosis about the abdominal inguinal ring.

3. Metastasis from the direct invasion of the uterus or tube by their mucosa with extension to the superficial lymphatics and veins and also from endometrial tissue escaping into uterine vessels during menstruation.

4. Implantations in a hernial sac

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Sampson 1925b heterotopic or misplaced endometrial tissue

Sampson JA. Heterotopic or misplaced endometrial tissue. Am J Obstet Gynecol 1925, 10(Nov)(5):649-664. doi: 10.1016/S0002-9378(25)90629-1.

*Read (by invitation) at a meeting of the Philadelphia Obstetrical Society, March 5, 1925.
https://doi.org/10.1016/S0002-9378(25)90629-1

Discussions by Drs. Ewing, Cullen, Spencer, Armytage, Brady, Novak, Casler, Graves, Heaney, and Sampson on Graves, Keene, Danforth, Heaney, and Sampson's papers is at:

Society Transactions, The American Gynecological Society, Fiftieth Annual Meeting, Washington, DC, May 4,5, and 6.

1925. Am J Obstet Gynecol 1925, 10(5):730-738
DOI: https://doi.org/10.1016/S0002-9378(25)90643-6

Quotes on epithelium and stroma: "characteristic uterine glands," "epithelial glands or ducts," "identical with that of the glands of the uterine mucosa. However, endometrial stroma was not present about them...," "epithelial glands with a histologic structure identical with those of the uterine mucosa," "menstrual blood escaping into the peritoneal cavity at times contains uterine and tubal epithelium and even fragments of endometrial stroma...," "the microscopic examination of this blood may show epithelial cells and even fragments of endometrial stroma," and "we appreciate the fact that menstrual blood differs from normal blood both in its chemical and its cellular elements. It may contain epithelium, stroma cells and possibly at times connective tissue and smooth muscle cells."

p649

"*The study of the mucosa lining the uterine cavity under different conditions demonstrates that it presents a varied structure and at times it would be difficult to recognize it were its situation not known. Misplaced endometrium-like tissue also presents a varied structure and its origin is not always the same. We believe that it arises from both the uterine and the tubal mucosa and possibly, when situated between the layers of the broad ligament, it may sometimes arise from remnants of the Wolffian body. We also know that gland-like inclusions of the peritoneal mesothelium and of the surface epithelium of the ovary arise from peritoneal irritation and that some of these lesions may simulate atypical endometrial tissue.*

For the above reasons misplaced endometrium-like tissue may be divided into two groups: true endometrial or Müllerian tissue, which is derived from the uterine and tubal mucosa, and pseudoendometrial tissue which arises from remnants of the Wolffian body, from a metaplasia of the peritoneal serosa, and possibly from other sources than those already mentioned."

"*The term endometriosis müllerianosis would possibly be more correct, as applied to the entire subject, than "endometrioma and endometriomyoma" as suggested by Blair Bell,[1] or "müllerianoma" as more recently suggested by Bailey.[2] The term endometriosis is more descriptive than Müllerianosis and is correct in the majority of instances, because we believe that the uterine mucosa is the chief source of these lesions.*"

[1] Bell, William Blair: Jour. Obst. and Gynaec. Brit. Emp., 1922, xxix, 443-446.

[2] Bailey, K. V.: Jour. Obst. and Gynaec. Brit. Emp., 1924, xxxi, 539-57

NOTE: This may be the first published reference to "endometriosis." The first may also be by Jacobson, the pathologist who worked with Sampson, in 1925.

Sampson discusses various terms including endometriosis, endometrioma, endometriomyoma, Müllerianosis, Müllerianoma

p649-650

Five groups

1 Direct or primary endometriosis (Müllerianosis), i.e., misplaced endometrial tissue in the uterine wall. (NOTE: now called adenomyosis.)

2. Peritoneal or implantation endometriosis. Deposits of endometrial or Müllerian tissue are found scattered throughout the pelvis, similar in their distribution to the peritoneal implantations of cancer, and like the latter often invading underlying structures.

3. Transplantation endometriosis. occurs in the scar of the abdominal incision after operations.

4. Metastatic endometriosis. This group includes extraperitoneal endometrial tissue.

5. Developmentally misplaced endometrial tissue. (I admit the possibility of such a condition, but have never been able to appreciate it.)

p650

For type 2, "*two questions present themselves: (a) Is this endometrium-like tissue true endometrial tissue? (b) What is its origin?"*

"In typical instances this tissue not only has a histologic structure identical with that found in the uterine wall due to its direct invasion by the mucosa lining the uterine cavity, but the reaction on the part of the host against this invasion is similar to that of the myometrium towards the uterine mucosa invading it. Furthermore, this misplaced endometrial tissue is governed by the same natural laws, in its reaction to menstruation, pregnancy, and the menopause, as the mucosa lining the uterine cavity. On the basis of its histologic structure and physiologic function we must conclude that this tissue is as truly Müllerian as that arising in the uterine wall from its direct invasion by the uterine mucosa."

p652

"*Menstrual blood differs from normal blood both in its chemical and in its cellular constituents. It is undoubtedly more irritating and as the result of this irritation and the reaction following it, gland-like inclusions of the peritoneal mesothelium and of the surface epithelium of the ovary may occur, just as they may occur in peritonitis of bacterial origin and in the serosal reactions against malignant implantations. Blood pigment (from the menstrual blood) and lymphocytes may be present in the tissue about these gland-like inclusions, thus suggesting endometrial tissue which has menstruated. These reactions cause confusion in the diagnosis of endometrial lesions and this is increased because both endometrial tissue and the reaction of the serosa just described may be present in the same section and endometrial tissue wherever situated does not always possess its characteristic structure.*"

p653

They are often found in different stages of development in the same individual, thus suggesting repeated implantations from the original source or from other endometrial foci in the pelvis such as uterine mucosa implanted on the surface of the pelvic structures or the rupture of an endometrial hematoma.

p655

"*When these endometrial hematomas or cysts were described by me in 1921, I was not aware that they had been previously recognized and described. Three years later I found that Pick had described them in 1905 and had designated them adenoma or cystoma endometriodes ovarii. Pick suggests that these cysts may be the same as Rokitansky's cystosarcoma adenoides ovarii uterinum described by the latter in his textbook of pathologic anatomy published in 1861. Should anyone's name he attached to-these ovarian cysts, it should be Pick's or Rokitansky's, not mine.*"

7. Pick, L. Arch f. Gynaek., 1905, lxxvi, 251-275

"*I have used and still use the term "endometrial" for all implantations of Müllerian origin.*"

p656-7

"*Endometrial tissue is sometimes so situated that if it came from the mucosa lining the uterine cavity or from the lesions of a peritoneal endometriosis it must have reached its present location by metastasis through lymph vessels or veins.*"

p658

"*Ries (1897) was the first to describe epithelial glands or ducts in pelvic lymph nodes.*" Ries, Emil: Ztschr. f. Geburtsh. u. Gymak., 1897, xxxvii, 518-532. Also quoted in Batt RE, ed. A History of Endometriosis. London: Springer-Verlag London Ltd. 2011

p659

"*The histologic structure of the glands in this lymph node was identical with that of the glands of the uterine mucosa. However, endometrial stroma was not present about them and I was unwilling to make a diagnosis. On the basis of their histologic structure they could have been of endometrial or müllerian origin.*"

p661

Epithelial glands with a histologic structure identical with those of the uterine mucosa have been found in the pelvic lymph nodes Some of these could have been metastatic from a uterine or peritoneal endometriosis, as they were associated with these lesions. I derived from a primary uterine endometriosis we should expect to find them not *only* in the pelvic, but also in the lumbar lymph nodes. If it shall be shown that they occur in women and not in men, their endometrial or müllerian origin will be more conclusive.

p662

"*The capillaries of the endometrium are often dilated and in the trauma associated with menstruation, menstrual blood might escape into them and be carried to the venous sinuses of the uterine wall and even into the venous circulation beyond the uterus.*"

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Batt dissertation p 330) "*Sampson was referring to Meigs who initiated the use of the term "(Sampson's cyst)," and undoubtedly others. See Meigs JV. Endometrial hematomas of the ovary. Boston Med Surg J 1922;clxxxvii:1-13:10, 12*

In 1925 Sampson divided heterotophic or misplaced endometrial tissue into five groups and published a classification based on etiology. Group 5 was "developmentally misplaced endometrial tissue." Sampson wrote: "I admit the possibility of such a condition, but have never been able to appreciate it." This study focuses explicitly on the etiology of Sampson's "developmentally misplaced endometrial tissue.""

p737: Sampson discussed sigmoid resection, appendectomy, and partial bowel obstruction.

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American Gynecological Society 1925 Discussions

AGS Society Transactions, The American Gynecological Society, Fiftieth Annual Meeting, Washington, DC, May 4,5, and 6. 1925. Am J Obstet Gynecol 1925, 10(5):730-738 DOI: https://doi.org/10.1016/S0002-9378(25)90643-6

Sampson presented and discussed "*heterotopic or misplaced endometrial tissue*" at the Fiftieth Annual Meeting of the American Gynecological Society

This has the discussions of the papers presented at the Fiftieth Annual Meeting of the American Gynecological Society by Drs. William Graves, Floyd Keene, William Danforth, N Sproat Heaney, and John Sampson in a "Symposium on Misplaced Endometrial Tissue." There are discussions by Drs. James Ewing, Thomas Cullen, Herbert Spencer, Green Armytage, Leo Brady, Emil Novak, DeWitt Casler, William Graves, N Sproat Heaney, and John Sampson. Drs. Ewing and Sampson used the term "endometriosis." Drs. Cullen, Brady, Graves, Danforth, and Heaney used the term "adenomyoma." Dr. Keene discussed Sampson's "perforating ovarian cysts." Dr Emil Novak discusses the deficiencies in Dr. Sampson implantation theory. Dr. DeWitt Casler discussed his menstruating ovarian "chocolate cyst containing about a dozen typical uterine polypi" that was a "a tumor of Müllerian origin." Dr Casler's 1919 case is in this file.

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Sampson 1925c endometrial carcinoma ovary

Sampson J. Endometrial carcinoma of the ovary arising in endometrial tissue in that organ. Arch Surg (now JAMA Surgery). 1925, 10(1):1-72. doi: https://doi.org/10.1001/archsurg.1925.01120100007001

Criteria for malignant transformation of endometriosis (i) the coexistence of benign and malignant tissue in the same ovary which have the same histologic relationship to each other, meaning thereby that tumor exists adjacent to the unequivocal foci of endometriosis, (ii) the carcinoma must actually be seen to arise in this tissue, meaning thereby that there must be an absence of any other primary tumor, and (iii) the presence of clear microscopic evidence of neoplasms originating from endometriosis.

He proposed that endometriosis has the potentiality towards malignant change as much as normal endometrium and that the endometriotic lesion might have a higher propensity.

The demonstration of morphological continuation between benign and malignant epithelium within the endometriosis was added as a fourth criterion by Scott in 1953.

Scott RB. Malignant changes in endometriosis. Obstet Gynecol. 1953, 2(3):283-9. PMID: 13087921

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Sampson 1926 endometriosis in inguinal hernia sac

Sampson JA. Endometriosis of the sac of a right inguinal hernia, associated with a pelvic peritoneal endometriosis and an endometrial cyst of the ovary. Am J Obstet Gynecol 1926, 12(4):459-483, doi: 10.1016/S0002-9378(15)30433-6. https://doi.org/10.1016/S0002-9378(15)30433-6

This has discussion of retrograde theory

Endometrial tissue has been found *"in the venous sinuses and possibly the lymphatics of the uterine wall operated upon during the menstrual period*."

"*Just as endometrial carcinoma invades the uterine wall so at times may benign endometrium do the same, the latter giving rise to a direct or primary uterine endometriosis, the so-called adenomyoma of mucosal origin or adenomyosis uteri interna.*"

"*This tissue may be unintentionally but successfully transplanted by the surgeon in human beings.*

Peritoneal endometriosis may be defined as implantation-like peritoneal lesions developing in women during their menstrual life and usually occurring in situations easily reached by material escaping into the peritoneal cavity from the tubes, ovaries or other pelvic structures. These lesions are characterized by the well-known results of peritoneal irritation such as granulation and scar tissue, adhesions and various peritoneal inclusions and in addition by the presence of endometrial tissue either on the surface of or embedded in these lesions, bearing the same relation to them as does cancer in peritoneal carcinosis and like the latter at times invading underlying structures."

"*The study of the distribution of the lesions of early pelvic peritoneal endometriosis at the time of operation demonstrates that they apparently consist of material escarping from the tubes or ovaries into the peritoneal cavity and the local reaction against the same. Four possible sources of this "material" suggest themselves.*"

Theoretical possibilities:

1. Bacterial infection.

2. Ovulation permitting fragments of ovarian tissue to escape into the pelvis.

3. The menstrual reaction of endometrial tissue on the surface of the ovary and the rupture or perforation of an endometrial cyst or hematoma of the ovary.

4. Menstrual blood escaping through the tubes as a back flow from the uterine cavity and from the tubal mucosa.

There is a discussion of each of the four points in the article. Sampson concluded that retrograde menstrual flow was the most likely.

Menstrual blood undoubtedly irritates the peritoneum causing inflammatory exudation, granulation tissue, adhesions and peritoneal inclusions. These would be the very conditions which would favor the retention and growth of any epithelium or other tissue present in this blood , just as similar peritoneal reactions make possible the retention and growth of fragments of cancer escaping into the peritoneal cavity.

There may be "typical and atypical uterine mucosa on the serosa (Figs. 7 and 10)"

"*Pelvic peritoneal endometriosis therefore represents but one phase of heterotopic or disseminated endometrial tissue just as peritoneal carcinosis secondary to cancer of the pelvic organs, represents only one phase of heterotopic or disseminated cancer*."

"*These lesions are characterized by the well-known results o£ peritoneal irritation such as granulation and scar tissue, adhesions and various peritoneal inclusions*"

"*The histology of the peritoneal changes in these lesions probably represents the reaction of the latter to two irritants, one the menstrual blood and the other the endometrial tissue. That due to the former is similar· to that found in peritonitis of infectious or other origin.*"

Inguinal endometriosis

"*Inguinal endometriosis may be defined as the presence of endometrial tissue in the groin. It has also been reported as adenomyoma of the groin and adenomyoma of the round ligament*."

The various theories are:

"*1. The congenital theory. The condition arises in developmentally misplaced portions of the Mailerian or Wolffian systems.*

2. The metaplasia theory. It is due to a metaplasia of the mesothelial lining of the processus vaginalis peritoneii or of the endothelial lining of dilated vessels.

3. A direct extension along the round ligament from a peritoneal endometriosis about the abdominal inguinal ring.

4. Metastatic through lymphatics or veins secondary to a peritoneal endometriosis invading the vessels accompanying the round ligament or from a primary uterine endometriosis, or even from endometrial tissue escaping into the uterine vessels during menstruation.·

5. Implantations in a hernia sac, or if we accept the metaplasia theory it is due to the reaction of the peritoneum of the sac to menstrual blood escaping into it."

"*The experimental work of Stilling,[1] Loeb[2] and others has shown that bits of uterine tissue of the lower animals may be transplanted to other parts of the body of the same animal and there grow*."

1. Stilling, H.: Versuche über Transplantation, IV, Mitteilung. Das Ergebnis der Transplantation von Uterusgewebe in die Milz, Beitr. z. path. Anat. u. z. allg. Path., 1910, xlvii, 499

2. Hesselberg, C., Kerwin, W., and Loeb, L.: Auto and homotransplantation of the uterus in the guinea pig. Jour. Med. Res., 1918, xxxviii, 11.

"*The experimental work of Jacobson[3] and others, especially the work of the former on monkeys, demonstrates that bits of uterine mucosa scattered in the pelvic cavities of these animals may give rise to peritoneal implantations of this tissue, resembling the lesions of peritoneal endometriosis in women*."

3. Jacobson, V.: The intraperitoneal transplantation of endometrial tissue, Arch. Path. and Lab. Med., 1926, i, 169.

In a previous communication, Sampson reported three cases of inguinal endometriosis.

Sampson J A: Inguinal Endometriosis, Am J Obstet Gynecol 1925, x(4)462-502. doi: 10.1016/S0002-9378(25)90591-1 https://www.ajog.org/article/S0002-9378(25)90591-1/fulltext

Three cases of inguinal endometriosis.

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Sampson 1927a peritoneal due to menstrual dissemination

Sampson JA. Peritoneal endometriosis due to the menstrual dissemination of endometrial tissue into the peritoneal cavity. Am J Obstet Gynecol. 1927, 14(4):422-469, doi: 10.1016/S0002-9378(15)30003-X. https://doi.org/10.1016/S0002-9378(15)30003-X

This is not in PubMEd and a serach commonly yelds the 1927 Am J Path article on venous dissemination.

Sampson (1927a) discussed infection and endometriosis. His photomicrographs on Figures 16, 17 and 18 demonstrate the similarities and differences between implantation and serosal reactions to gonorrhea, cancer and endometriosis.(Sampson, 1927a)

p 424-425

"*three suggestions or theories present themselves.*

1. Peritoneal endometriosis might be caused by menstrual blood escaping from endometrial tissue on or in other pelvic organs and structures than the ovary.

2. Endometrial tissue in the ovary might arise from the implantation of bits of that tissue carried by menstrual blood escaping through the tubes and also from endometrial foci on other pelvic organs or structures.

3. The peritoneal endometriosis, so often associated with endometrial tissue in the ovaries and apparently secondary to the latter, at times, might have arisen from some other source."

p425

"*I fully realize that the implantation theory does not account for all instances of ectopic endometrium-like tissue in the pelvis and that menstruation is only one means of disseminating that tissue. I value the opinion of those who believe in the differentiation of celomic epithelium as a source of endometrial tissue in the ovary and peritoneum.*"

p427 venous sinuses

Fig. 5.-Two photomicrographs (x 60), the upper one of the menstrual contents of the endometrial cavity of the ovary shown in Fig. 4 and the other of the uterine cavity. They are much alike. Blood and fragments of endometrial tissue are present in both, histologically in a fair state of preservation and possibly as capable of living, if transferred to a suitable situation, as endometrial emboli disseminated into veins during menstruation.

p429, Fig 7. The fibroblastic character of the peritoneum covering the endometrial tissue shows that it is of recent origin.

p438-439

His photomicrographs on Figures 16, 17 and 18 demonstrate the similarities between implantation and service reactions to gonorrhea, cancer and endometriosis.

Figure 16. Photomicrograph (X 130) showing the reaction of the surface of the ovary to gonorrheal infection escaping through the tubes. An inflammatory exudate is present on the surface of that organ which consists of fibrin. leucocytes and wandering cells derived from the tissues of the ovary. The greater portion of the surface epithelium has disappeared. In the center of the photomicrograph it (s.e.) is still present and the exudate has arched over it. If the irritation had continued. the exudate would be replaced by granulation tissue and later by connective tissue with resulting thickening of the: ovary or adhesion to adjacent structures. As the result of this reaction to infection. many interesting gland-like structures and cavities lined by the surface epithelium of the ovary arise from the inclusion of this epithelium and its subsequent growth, but they never develop into peritoneal carcinosis or true peritoneal endometriosis.

p 450, fig 33 Left broad ligament pocket. "*In a shallow peritoneal pocket directly beneath the ostium of the tube, the endometrial lesion shown in Fig. 34 was obtained*."

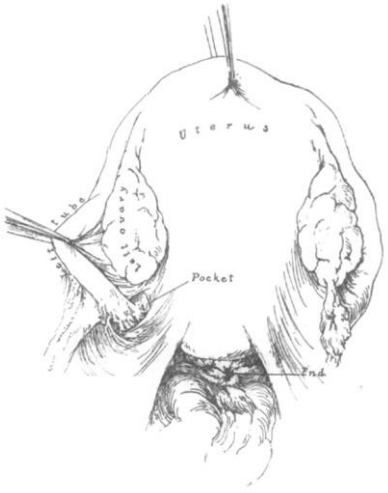


Fig 34. Endometriosis in pocket of Fig 33.

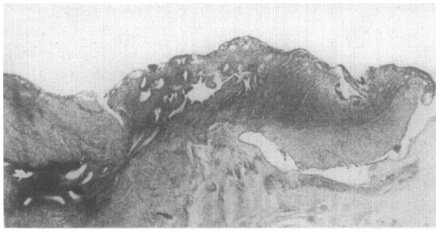


Fig 16 Reaction to gonorrhea

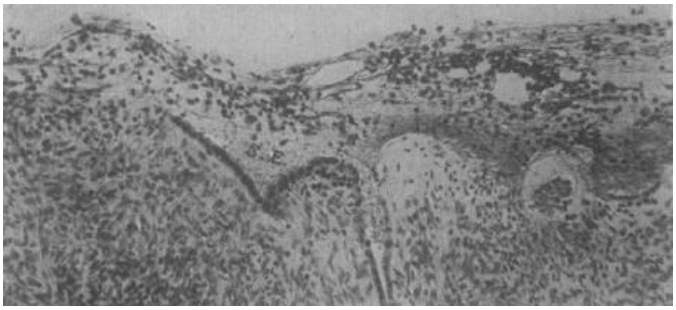


Figure 17 Cancer implantation

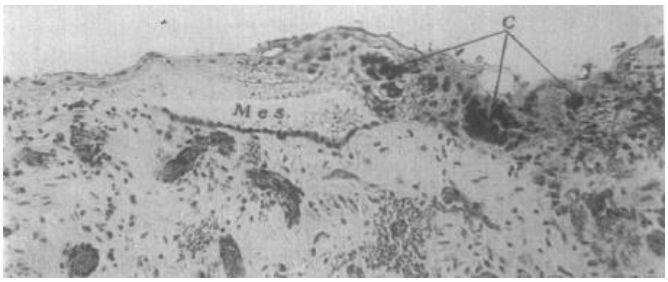
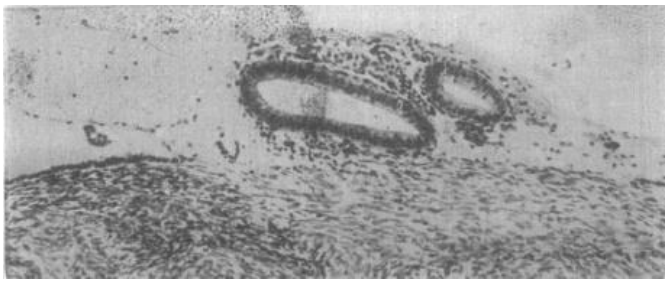


Figure 18 with endometriosis is associated with an inflammatory exudate similar to Fig 16 & 17.



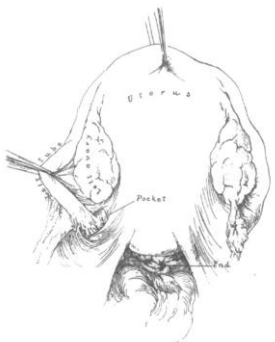
p 439

Page Hemorrhagic ovarian cysts often had endometrial tissue within the adhesions. "*Endometrial tissue is often present in these adhesions and invades the structures involved by them*."

Sampson 1927a peritoneal endometriosis due to menstrual dissemination

p 450

Fig 33 Left broad ligament pocket. "*In a shallow peritoneal pocket directly beneath the ostium of the tube, the endometrial lesion shown In Fig. 34 was obtained*."



p 463

Lesions include both "*typical endometrium with glands and stroma identical with that of the müllerian mucosa from which it came, and also dilated glands or cyst-like cavities lined by epithelium with very little or no characteristic endometrial stroma about it*."

p 466

"*both typical and atypical endometrial tissue was found and one could trace the transition of one type of lesion into the other, just as one can follow a similar transition in the endometrial lesions of as direct endome*triosis."

As the result of the reaction to gonorrheal infection, gland-like structures lined by the surface epithelium of the ovary arise, but they never develop into peritoneal carcinosis or true peritoneal endometriosis.(Sampson, 1927a)

Menstrual blood escapes into the peritoneal cavity from

(1) the rupture or perforation of endometrial cysts or cavities of the ovary and possibly of other pelvic structures;

(2) menstruating endometrial tissue growing on the surface of the ovary and other pelvic structures;

(3) the uterine cavity as a back flow through the tubes;

(4) menstruating tubal mucosa.

Menstrual blood, irrespective of its source, at times, contains bits of endometrial tissue set free by menstruation.

Endometrial tissue disseminated by menstruation is sometimes alive and will continue to grow, if transferred to situations suited to its growth.

The peritoneum and surface of the ovary are suited to the growth of endometrial tissue.

The lesions of peritoneal endometriosis often occur in situations and under conditions indicating (at least suggesting) their origin from menstrual blood escaping from the above mentioned sources.

The local reaction of the peritoneum to the endometrial tissue in peritoneal endometriosis is similar to the local reaction of the peritoneum to cancer in peritoneal carcinosis of implantation origin.

These studies indicate that peritoneal endometriosis sometimes arises from· the implantation of endometrial tissue disseminated by menstrual blood escaping into the peritoneal cavity. Endometrial and tubal tissue disseminated by other means may do the same. This phase of the subject will be considered in a latter paper.

In some cysts, "*typical endometrial tissue was found with a histologic structure identical with that of the mucosa of the uterus. In others, only atypical endometrial tissue was present, but similar to that often encountered in an endometriosis arising from the invasion of the uterine wall by its mucosa and by that of the tube. In still others, both typical and atypical endometrial tissue was found and one could trace the transition of one type of lesion into the other, just as one can follow a similar transition in the endometrial lesions of as direct endometriosis*."

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Sampson 1927b dissemination into venous circulation

Sampson. John A. Metastatic or embolic endometriosis, due to the menstrual dissemination of endometrial tissue into the venous circulation. Am J Pathol. 1927, 3(2): 93–110 and 22 plates. PMID: 19969738, PMCID: PMC1931779. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1931779/

Discusses use of extirpated uterine specimens to develop the data for his 1918 article and how that expanded into this study demonstrating the dissemination of endometrial tissue.

In an article (intestinal adenomas, Arch Surg) published in I922, I suggested that endometrial tissue might metastasize through lymph vessels, because I had found an endometrial polyp projecting into the lumen of a lymph vessel situated between the layers of the broad ligament. This polyp had arisen from the invasion of the vessel by endometrial tissue outside of the vessel pushing the endothelial lining of the lymphatic ahead of it. I also added that metastases might arise from the direct invasion of the uterine wall by the mucosa lining its cavity and from a similar invasion of the tubal wall by its mucosa.

Plate 24.

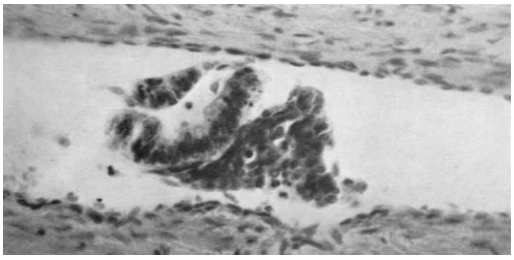

Fig. 20. Photomicrograph (x 3I0) of a portion of a vein of the uterine wall showing a piece of the uterine mucosa lying free in its lumen; from the same uterus as that shown in Fig. 19a; section taken near the surface of another block. I cannot exclude the origin of this tissue from the menstrual dissemination of bits of the uterine mucosa into the venous circulation of the uterus, but for the reasons given in the legend of Fig. 19b I believe that it also is more apt to be an artefact.

Plate 41

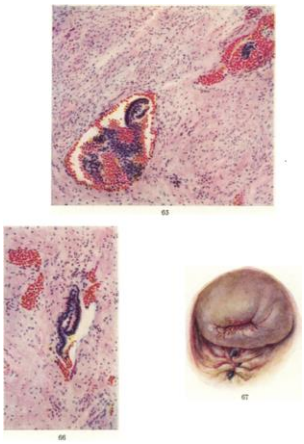

Fig. 65. Colored photomicrograph (x I30) of a portion of the peripheral zone of the right half of the posterior uterine wall (Case 4). The patient was operated upon the second day of menstruation. Fragments of endometrial tissue (emboli) are present in two veins (probably two sections of one vein). It is natural to assume that they were set free by the menstrual reaction of either an embolic growth in a vein or else from the mucosa lining the uterine cavity. The implantation of such emboli in veins would give rise to lesions similar to those shown in Figs. 41, 49 and 52.

Yovich (2020) reviewed Sampson's theories and has illustrations of the venous material from Sampson's 1927b AJP publication.

Yovich JL, Rowlands PK, Lingham S, Sillender M, Srinivasan S. Pathogenesis of endometriosis: Look no further than John Sampson. Reprod Biomed Online. 2019 Oct 24. pii: S1472-6483(19)30783-7. doi: 10.1016/j.rbmo.2019.10.007. PMID: 31836436

Vallvé-Juanico (2019) added circulating stromal cells.

Vallvé-Juanico J, López-Gil C, Ballesteros A, Santamaria X. Endometrial stromal cells circulate in the bloodstream of women with endometriosis: A pilot study. Int J Mol Sci. 2019, 20(15):3740. doi: 10.3390/ijms20153740, PMID: 31370190, PMCID: PMC6695832.

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Sampson 1928 endometriosis following salpingectomy

Sampson JA. Endometriosis following salpingectomy. Am J Obstet Gynecol 1928, 16(4):461-499. doi: 10.1016/S0002-9378(28)90534-7
https://doi.org/10.1016/S0002-9378(28)90534-7
https://www.ajog.org/article/S0002-9378(28)90534-7/fulltext

"*The name, endometriosis, was used by me[1] to indicate conditions arising from both misplaced uterine and tubal mucosa. even though I realized that it was not strictly correct in the latter. At the time it was stated that müllerianosis would be an inclusive and a correct term. Unfortunately, it suggests an embryonic origin, does not specify its derivation from mucosa and is not as descriptive as endometriosis.*"

"*(1) Sampson, J. A.: Am. Jour. Obst. and Gynec., 1925, x, 649.*"

"*Summary*

1. Endometriosis was found in and about the tubal stumps in 30 of 36 patients who had had a previous salpingectomy or tubal sterilization.

2. Postsalpingectomy endometriosis usually arises from sprouts growing out from the traumatized mucosa of the tubal stump. These sprouts may invade not only the wall of the tube but also the uterine cornu and any structure adjacent or adherent to the stump, such as the tissues of the broad ligament, the ovaries (3 cases), and even the abdominal wall (2 cases).

3. The misplaced tubal mucosa in these lesions, at times, retains its original structure and at other times assumes both the structure and function of the uterine mucosa including its reaction to menstruation and pregnancy. It presents the histologic picture of endometriosis of nonoperative origin including typical endometrial cysts or hematomas of the ovary.

4. In the various operative procedures, incident, to salpingectomy, bits of tubal and uterine mucosa may be transplanted by the surgeon both in the immediate field and also in remote ones. Endometriosis, with the same histologic structures as that present in sprouts, springs up as seedlings in situations where tubal and uterine epithelium might have been

sown. It is natural to assume that some of these seedlings sprang from epithelium transplanted by the surgeon.

5. If tubal epithelium transplanted during salpingectomy grows, it should also grow if transplanted during other operations than salpingectomy and by other means than operations."

References

1. Sampson, J. A.: American Journal of Obstetrics and Gynecology 1925 10:649 (OK, have PDF)

2. Blair-Bell: Journal of Obstetrics and Gynecology the British Empire 1922 29:443

3. Bailey, K. V.: Journal of Obstetrics and Gynecology the British Empire 1924, 31:539

4. Sampson, J. A. American Journal of Obstetrics and Gynecology 1922 9:465 Vol 9(4) is 1925 & 465 in not his. P 465 is in The Life History of Ovarian Hematomas (Hemorrhagic Cysts) of Endometrial (Müllerian) Type. 4(5):451-512. (OK, have PDF AJOG/TAGS)

5. Cullen, R. S. American Journal of Obstetrics and Gynecology 1922 9:562: 9(4):565 is in 1925 and is not his. I did not find it in 1922. /TAGS?

6. Nicholson GW Journal of Obstetrics and Gynecology the British Empire 1926 33:620

7. Novak, Emile: American Journal of Obstetrics and Gynecology 1926 12:520 /TAGS? → 1926, 12(4):484-526

Novak E. The significance of uterine mucosa in the fallopian tube, with a discussion of the origin of aberrant endometrium. Am J Obstet Gynecol 1926, 12(4):484-526. doi: 10.1016/S0002-9378(15)30434-8

https://doi.org/10.1016/S0002-9378(15)30434-8

"*Novak[7] questions the origin of the endometrial tissue in abdominal scars by transplantation." "He believes that the arguments which he has set forth in his paper speak for the possibility of the origin of such growths from the coelom-derived peritoneum, as with similar growths elsewhere in the peritoneum*." Complete quote @EndoRefsEndoNotes

8. Jacobson, P. C.: Archives Pathology and Laboratory Medicine 1926 1:169

9. Dougal, Daniel: Journal of Obstetrics and Gynecology the British Empire 1926, 33:439

10. Heaney, M. S.: American Journal of Obstetrics and Gynecology, 1925 10:625

11. Danforth, W. C. American Journal of Obstetrics and Gynecology, 1925, 10:631

12. Schwartz, O. H. Endometrial tissue in the abdominal scar following cesarean section. Am J Obstet Gynecol 1927 13(3):331-333. https://www.ajog.org/article/S0002-9378(27)90458-X/fulltext

13. Sampson, J. A. Am J Pathology. 1927b, iii, 93

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Sampson 1930 postsalpingectomy endosalpingiosis

Sampson JA. Postsalpingectomy endometriosis (endosalpingiosis). Am J Obstet Gynecol 1930, 20(4):443-480. doi: 10.1016/S0002-9378(16)42561-5

https://doi.org/10.1016/S0002-9378(16)42561-5
https://www.ajog.org/article/S0002-9378(16)42561-5/fulltext

Operative injury disturbs tissue balance. This is followed by repair. Should the organ or structure injured be lined or covered by epithelium, epithelial as well as connective tissue. This repairative response is generally local but, with endosalpingiosis, "*the growth of tubal epithelium, initiated by operative injury, not only actually invades the tubal stump and sometimes any structure adherent to it but it also may continue to grow after healing has occurred. Seedlings are also sometimes found in situations where bits of tubal mucosa might have been misplaced (transplanted) at the original operation*."

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Sampson 1940 development of the implantation theory

Age 67 in 1940 (1873-1946)

Sampson J.A. The development of the implantation theory for the origin of peritoneal endometriosis. Am J Obstet Gynecol. 1940, 40(4):549-557. doi: 10.1016/S0002-9378(40)91238-8
AJOG: https://doi.org/10.1016/S0002-9378(40)91238-8

Sampson concluded that theory is of secondary importance and emphasized the acquisition of knowledge, the care of patients, and the need to resolve the unsolved problems of endometriosis.

p549 Great attention paid to small implants, sketches, selection of sections to be submitted, supervision of technicians, and giving cutting instructions.

"During the intensive study of this subject the distribution and character of its lesions were carefully noted at operation. Sketches were frequently made at that time. Great attention was paid to small implants. When feasible these were excised. Drawings, many in color, were made of all specimens of endometriosis before they left the operating room floor. All material was fixed intact in formalin. After fixation, I selected the exact portions of the specimens which I wished to study histologically. This tissue was embedded in celloidin, since it causes less unequal tissue shrinkage than paraffin. I supervised the mounting of the embedded tissue and instructed the technician how it should be cut. A small notebook was carried, in which I jotted down "inspirations" before they vanished."

p550 The Implantation Theory

p552 "I then believed that these cysts arose either from a metaplasia of the surface epithelium of the ovary or from congenitally misplaced epithelium of endometrial type in that organ. These theories are not as convincing to me, at the present time, as the implantation theory."
p553 "As a result of greater ability in recognizing the lesions of peritoneal endometriosis at operation, 33 cases of this condition associated with endometrial cysts of the ovary were encountered in one year, as compared with 23 similar cases which had been previously collected over a period of more than ten years." 2.3 a year →33 a year
p554 "peritoneal endometriosis could be derived from tubal as well as from uterine mucosa."
p554 "It is true that there is *no positive proof* that epithelium escaping from these cysts becomes implanted on the peritoneum."

p554 “Since 1922 many patients, requiring pelvic operations, have purposely been operated upon during menstruation. Not infrequently blood was observed escaping through the patent abdominal ostia of the tubes of these patients. This occurs in patients with and without peritoneal endometriosis. Bits of viable appearing uterine mucosa surrounded by blood were found in sections of some of the above described tubes after they had been fixed in formalin.”
p554 “*Subsequent studies have shown that a secondary spread of endometriosis also could arise from foci in other situations than the ovary*.”
p556 “Circumstantial evidence indicates that Müllerian tissue in this blood, under favorable conditions, becomes implanted on any structure upon which it may lodge.”
p556 “When it invades other organs or structures than the ovary, a type of endometriosis arises which both grossly and histologically often closely resembles a direct endometriosis of the uterine wall.” [adenomyosis]
p557 “The viability of this theory is of secondary importance to me as compared with the pleasure and the increased knowledge of this and kindred subjects which I have gained in these studies and the resulting more intelligent treatment of patients who have peritoneal endometriosis. There are many other interesting unsolved problems associated with the pathogenesis and life history of endometriosis of all types.”
In studying the pathogenesis of ovarian and other forms of peritoneal endometriosis, one must not lose sight of the important role evidently played by patency of the tubes.

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At times, during menstruation, blood, carrying bits of Müllerian mucosa, escapes through patent tubes into the peritoneal cavity. This blood may come either from the uterine or from the tubal mucosa. Circumstantial evidence indicates that Müllerian tissue in this blood, under favorable conditions, becomes implanted on any structure upon which it may lodge. These early primary implants occur most frequently in close proximity to the distal ends of the tubes, such as the lateral and under surfaces of the ovary, the lower portions of the posterior surfaces of the uterus and broad ligaments, and the bottom of the cul-de-sac. They may be present only on the ovary or ovaries, only on the peritoneum, or in both situations. Some of these implants remain small and superficial. The Müllerian mucosa in others invades its host much like implantation carcinoma. When it invades other organs or structures than the ovary, a type of endometriosis arises which both grossly and histologically often closely resembles a direct endometriosis of the uterine wall.

The invasion of the ovary by Müllerian mucosa implanted on its surface and the conditions resulting from it are in many ways similar to those arising from the invasion of the other organs and structures by this tissue except for one very striking difference. The ectopic endometrial cavities distended with menstrual blood in endometriosis, in other situations than the ovary, are usually small while those in the ovary frequently attain a large size, forming the well-known endometrial cysts of that organ. Whether small or large these ovarian cysts often rupture and some of their contents escapes into the peritoneal cavity frequently causing adhesions, and, under favorable conditions, the judged peritoneal implantation of bits of the epithelial lining of the cyst which had been cast off by menstruation. In patients with peritoneal endometriosis associated with an endometrial cyst of the ovary, both primary implants from or through the tubes and secondary ones from the cyst may be present.

The study of peritoneal endometriosis also indicates that menstrual blood may not only escape from foci of endometriosis in other situations than the ovary, but adhesions and an additional spread of the endometriosis (secondary implants) may arise from this source. On account of the usual small size of the superficial foci of serosal endometriosis, the results of their participation in menstruation are not as striking as those which take place in the ovarian cysts.

If bits of Müllerian mucosa carried by menstrual blood escaping into the peritoneal cavity are always dead, the implantation theory, as presented by me, also is dead and should be buried and forgotten. If some of these bits are even occasionally alive, the implantation theory also is alive.

The viability of this theory is of secondary importance to me as compared with the pleasure and the increased knowledge of this and kindred subjects which I have gained in these studies and the resulting more intelligent treatment of patients who have peritoneal endometriosis. There are many other interesting unsolved problems associated with the pathogenesis and life history of endometriosis of all types. Since it is my desire to adhere strictly to the text which has been assigned me, I have not discussed any of these.

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Sampson 1945 postsalpingectomy endometriosis AJOG

Sampson JA. The pathogenesis of postsalpingectomy endometriosis in laparotomy scars. Am J Obstet Gynecol. 1945 Dec;50:597-620. doi: 10.1016/0002-9378(45)90039-1. PMID: 21007063.

https://doi.org/10.1016/0002-9378(45)90039-1

The first recorded case of endometriosis in a laparotomy scar was published by Meyer in 1903. In keeping with observations made in the cases reported in the present paper, his case also followed salpingectomy and rentrofisation of the uterus.

Van Franque (1916) was the first to suggest that scar endometriosis might arise from the growth of bits of uterine mucosa transplanted into the abdominal mound.

Review of 11 or more reports of 2 to 390 cases in the literature and discusses 17 from Albany, some of which were previously published. 16 after salpingectomy, one after myomectomy. Endometriosis was found about the tubal stumps in 13 uterine cornua.

Gelatin injestion demonstrated the continuity of tubules with the uterine cavity. The same “telltale” gelatin indicated the source of the endometriosis and the routes taken by sprouts from normally situated Müllerian mucosa in their invasion of the scar. The longest tract was 7 cm.

A tubule is a Müllerian gland with no appreciable stroma and a gland is a Müllerian tubule clathed in stroma.

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RELATED REFERENCES (Chronologic)

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Casler 1919 menstruating ovary

Casler DB. A unique diffuse uterine tumor, really an adenoma, with stroma, but no glands. Menstruation after complete hysterectomy due to uterine mucosa in remaining ovary. Trans Am Gynecol Soc. 1919, 44:69-84 and 15 plates

Transactions of the American Gynecological Society 1919 https://www.google.com/books/edition/Transactions_of_the_American_Gynecologic/SaBEAAAAYAAJ?hl=en&gbpv=0

Stroma may be more active than glands in the development of adenomyoma. "*This uterine tissue in the ovary originates from remains of the Müllerian ducts*." Sampson (1921) discussed cases reported by Russell, Lockyer, Casler, Semmelink, and Cullen. Batt (2011) called this a "menstruating ovary."

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Bell 1922 endometrioma & endometriomyoma

Bell WB. Endometrioma and endometriomyoma of the ovary. J Obstet Gynaecol Brit Emp 1922, xxix:443–446.1 with three plates

https://babel.hathitrust.org/cgi/pt?id=uc1.$b330790&view=1up&seq=475

Many examples of so-called 'adenomyomata' and 'adenofibromyomata' of the rectovaginal septum, uterosacral, round andovarian ligaments, and, indeed, a few of theFalloppian tubes, the sigmoid colon, the umbilicus and the rectus muscle have been recorded. I have myself seen numerous instances in the commoner situations. These extra-uterine growths have been described as 'adenomyomata' and 'adenofibromyomata' no less wrongly than in the case of the similar neoplasms which occur very oftenin the uterus. For manv years I have referred to such tumours as 'endometriomata' or as 'endometriomyomata' and 'endometriofibromyomata.'

In the United States this has been recognized recently by Sampson[4]. Previously Russell[3], Casler[1], Cullen[2] and others had observed the presence of endometrium in an ovary without attaching to it the special clinical significance to which I have referred.

1. Casler, De Witt, B. Trans. Amer. Gynecol. Soc., 1919, xliv, 69.

2. Cullen, T. S. Archiv. Surg., 1920, i, 215.

3. Russell, W. W. Hull. Johns Hopk. Hosp., 1899, x, 8.

4. Sampson, J. A. Trans. Amer. Gynecol. Soc, 1921, xlvi, 162.

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Bailey 1924 aberrant müllerian elements

Bailey KV. The etiology, classification, and life history of tumors of the ovary and other female pelvic organs containing aberrant müllerian elements, with suggested nomenclature. J Obstet Gynaecol Brit Emp 1924, xxxi:539-579 and plates 522.1-522.25

https://babel.hathitrust.org/cgi/pt?id=uc1.$b330792&view=1up&seq=661

K. Vernon Bailey, M.C., M.D., Ch.B. (Manchester),

This work deals with that tumour of the female pelvis known as " adenomyoma," but only in its extra-uterine pelvic situations, or when in the uterine body, having no connexion with the uterine mucosa. Many authors have described the occurrence of this tumour in various situations of the body, from the pelvis to the umbilicus, notably Cullen and Sampson, and the diffuse uterine "adenomyoma," the mucosal origin of which was clearly demonstrated by Cullen in 1896, is a condition so well investigated as to leave its pathology in no doubt whatsoever.

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Transactions 1925, American Gynecological Society

Society Transactions, The American Gynecological Society, Fiftieth Annual Meeting, Washington, DC, May 4,5, and 6. 1925. Am J Obstet Gynecol 1925, 10(Nov)(5):730-738. doi: 10.1016/S0002-9378(25)90643-6
DOI: https://doi.org/10.1016/S0002-9378(25)90643-6

This has the discussions of the papers presented at the Fiftieth Annual Meeting of the American Gynecological Society by Drs. William Graves, Floyd Keene, William Danforth, N Sproat Heaney, and John Sampson in a "Symposium on Misplaced Endometrial Tissue." There are discussions by Drs. James Ewing, Thomas Cullen, Herbert Spencer, Green Armytage, Leo Brady, Emil Novak, DeWitt Casler, William Graves, N Sproat Heaney, and John Sampson. Drs. Ewing and Sampson used the term "endometriosis." Drs. Cullen, Brady, Graves, Danforth, and Heaney used the term "adenomyoma." Dr. Keene discussed Sampson's "perforating ovarian cysts." Dr. Emil Novak discusses the deficiencies in Dr. Sampson's implantation theory. Dr. DeWitt Casler discussed his case of a menstruating ovarian "chocolate cyst containing about a dozen typical uterine polypi" that was "a tumor of Müllerian origin" occurring after a hysterectomy. Dr. Casler's 1919 publication of this case is in this file.

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Jacobson 1925 clinical & experimental aspects of endometriosis.

Jacobson VC. Certain clinical and experimental aspects of ectopic endometriosis. Bulletin of the New York Academy of Medicine. 1925;1(Nov)(9):385. PMCID: PMC2387491. (abstract)
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2387491/

Experimental induction of endometriosis by intraperitoneal autotransplantation of endometrium during oestrus was successful in sixteen (84%) of 19 rabbits.

"*There is no evidence in these experiments in favor of the view that endometrial tissue can be formed by metaplasia of mesothelium*."

Jacobson was a pathologist at Albany Medical College at the same time as Dr. Sampson and discusses "*Sampson's syndrome*" and "*endometriosis*."

His refertences to Sampson included:

Arch. Surg., 1921, iii, 245-323; ibid., 1922, v, 217-280

Boston Med. and Surg. Jour., 1922, clxxxvi 445-456

Amer. Jour. Obs. and Gyn., 1922,1v, 5.

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Keene 1925 article and discussion

Keene FE. Perforating ovarian cysts (Sampson's) with invasion of the bladder wall; Report of two cases. Society Transactions of the American Gynecological Society Fiftieth

Annual Meeting Washington, DC, May 4, 5, and 6. Am J Obstet Gynecol 1925, 10(5):619-625

DOI: https://doi.org/10.1016/S0002-9378(25)90624-2

https://www.sciencedirect.com/science/article/abs/pii/S0002937825906242

Discussion in Am J Obstet Gynecol 1925, 10(5):730
DOI: https://doi.org/10.1016/S0002-9378(25)90643-6

See "*Transactions 1925, American Gynecological Society*"

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Scott 1953a experimental endometriosis

Scott RB, Te Linde RW, Wharton LR Jr. Further studies on experimental endometriosis. Am J Obstet Gynecol. 1953 Nov;66(5):1082-1103. doi: 10.1016/s0002-9378(16)38618-5, PMID: 13104506.
https://www.ncbi.nlm.nih.gov/pubmed/13104506
DOI: https://doi.org/10.1016/s0002-9378(16)38618-5

Scott and TeLinde published several articles on experimental endometriosis. They concluded that endometriosis is likely from implantation and growth of endometrial fragments shed via the tubes at the time of menstruation, lymphatic dissemination, and vascular dissemination. Metaplasia of pelvic (or celomic) peritoneum or other tissues in the pelvis was considered the less likely of hypotheses.

In this study, six of ten surgically altered Rhesus monkeys with intra-abdominal menstruation developed endometriosis. Furthermore, four Rhesus monkeys with direct utero-abdominal wall fistulas bypassing the peritoneum developed endometriosis.

In the summary of this paper, he considered that "*if serial sections of all pelvic tissue were feasible, might not all 40-year-old women with patent tubes and normal menstrual cycles, regardless of parity, reveal some endometriosis?*"

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Scott 1953 malignant changes in endometriosis

Scott RB. Malignant changes in endometriosis. Obstet Gynecol. 1953, 2(3):283-9. PMID: 13087921

Added 4th criteria to Sampson (1925c) Endometrial carcinoma of the ovary arising in endometrial tissue in that organ. Arch Surg

Criteria for malignant transformation of endometriosis from Sampson

(i) the coexistence of benign and malignant tissue in the same ovary which have the same histologic relationship to each other, meaning thereby that tumor exists adjacent to the unequivocal foci of endometriosis,

(ii) the carcinoma must actually be seen to arise in this tissue, meaning thereby that there must be an absence of any other primary tumor, and

(iii) the presence of clear microscopic evidence of neoplasms originating from endometriosis.

Scott (1953) added demonstration of morphological continuation between benign and malignant epithelium within the endometriosis.

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Batt 1985 congenital and acquired endometriosis.

Batt RE. Minimal endometriosis treatment and relationship to infertility. Presented at the Congress on Obstetrics and Gynecology, Beijing, June 19, 1985.

From Batt 2015 Müllerianosis EFA
https://www.endofound.org/video/ronald-batt-md-mullerianosis-embryonic-endometriosis-adenomyosis-endosalpingiosis-and-endocervicosis/1254

Dr. Jordan Phillips, president of the AAGL asked Dr. Batt to be the keynote lecturer on endometriosis at the First Chinese International Congress on Obstetrics and Gynecology in Beijing in 1985. "At that time, I said there were two types of minimal endometriosis; the congenital and acquired forms. This is from my notes of my lecture, "The human female may harbor endometriosis from embryonic life until death, the disease being active or inactive at various times. We view the histogenesis of endometriosis as a continuum starting with cases of congenital endometriosis originating in embryonic life, followed by cases of acquired endometriosis originating from the endometrium." This was subsequently refined and presented as "Duplications of the Müllerian System and Pelvic Endometriosis" at the First World Congress on Endometriosis, Clermont-Ferrand, France, 1986 and published in 1989 as "Embryologic Theory of the Histogenesis of Endometriosis in Peritoneal Pockets."

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Redwine1988 Mülleriosis is the best-fit model

Mülleriosis refers to a developmental defect in the differentiation or migration of any cellular component of the müllerian duct system. This paper, although it says otherwise, reinforces the concept that Mülleriosis, retrograde dissemination and implantation, lymphatic and hematogenous theories start with a normal endometrial cell or precursor stem cell that must undergo change to become endometriotic. In addition to his theory of Mülleriosis, he believes that mesoderm in the endothelium can undergo metaplasia into endometriosis.

In the1980s, all observations were based on H&E stains. There were no inflammatory, CD10, aromatase, or other markers of endometriosis were examined. No inflammation or fibrosis is noted on his pictures. By now, we know that deep fibrotic lesions have characteristics of endometriosis, but early lesions may not. He was studying those early lesions for which we still have even less clarification.

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Batt 1989 Embryologic theory of peritoneal pockets.

Batt RE, Smith RA. Embryologic theory of histogenesis of endometriosis in peritoneal pockets. Obstet Gynecol Clin North Am. 1989 Mar;16(1):15-28. PMID: 2664615.

Batt considered pockets to be congenital Müllerian remnants and not acquired lesions. He considered the acquired pockets in Martin's 1988 slide set [now a PDF] were due to surgical trauma. [https://www.danmartinmd.com/files/lae1988.pdf]

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Martin 1990 Atlas of Endometriosis

Martin DC (ed). *Laparoscopic Appearance of Endometriosis*, Volume I, Memphis: Resurge Press, 1990.
https://www.danmartinmd.com/files/lae1990.pdf

Chapters and other material are from Dr. Dan Martin, Dr. David Redwine, Dr. Arnold Kresch and Dr. Harry Reich.

There are sections on recognition of endometriosis, laparoscopic excision of endometriosis (LAPEX) by sharp dissection, therapeutic laparoscopy, history forms, laparoscopy information for patients, results of coagulation results, results of $C0_2$ laser, results of argon laser, results of Nd:YAG laser, myomectomy, hysterectomy, and morphine block of focal pain

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Redwine 2002 Was Sampson wrong?

Redwine DB. Was Sampson wrong? Fertil Steril. 2002 Oct;78(4):686-93. doi: 10.1016/s0015-0282(02)03329-0. PMID: 12372441.

This continues his 1988 theory of Mülleriosis that can be contrasted with Batt's Müllerianosis. Table 1 lists 38 differences between endometriosis and eutopic endometrium in humans and implies that transition is dependent on the location of the cell of origin but does not consider that the cell of origin for Müllerian remnants and retrograde implantation are both Müllerian. He selective quotes his references and does not consider that most of his argument is about transition rather than a cell of origin.

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Nap 2004 pathogenesis

Nap AW, Groothuis PG, Demir AY, Evers JL, Dunselman GA. Pathogenesis of endometriosis. Best Pract Res Clin Obstet Gynaecol. 2004 Apr;18(2):233-44. doi: 10.1016/j.bpobgyn.2004.01.005. PMID: 15157640.

Sampson's reflux implantation theory is supported by the distribution of the lesions in the abdominal cavity, the demonstration of the viability of shed menstrual endometrium in tissue culture, the high prevalence of pelvic endometriosis in girls with congenital menstrual outflow obstruction, and animal experiments in which endometriosis was induced by the creation of uteropelvic fistulas or by obstruction of antegrade menstruation, thus forcing retrograde menstruation to take place. The last two observations point to the fact that increased retrograde shedding of menstrual endometrium increases the likelihood of developing endometriosis. This is supported by the fact that menstruations are often longer and heavier in women with endometriosis.

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Batt 2007 Müllerianosis

Batt RE, Smith RA, Buck Louis GM, Martin DC, Chapron C, Koninckx PR, Yeh J. Müllerianosis. Histol Histopathol. 2007 Oct;22(10):1161-6. doi: 10.14670/HH-22.1161. PMID: 17616942.

Müllerianosis may be defined as an organoid structure of embryonic origin; a choristoma composed of müllerian rests - normal endometrium, normal endosalpinx, and normal endocervix - singly or in combination, incorporated within other normal organs during organogenesis.

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Batt 2011 A History of Endometriosis

Batt RE. A History of Endometriosis. Springer-Verlag London Ltd., London, 2011.
https://www.google.com/books/edition/A_History_of_Endometriosis/JyoywyVfIhkC?hl=en&gbpv=0
https://www.springer.com/us/book/9780857295842

Sampson is coved in three chapters: Theory of implantation; endometriosis, life history of ovarian endometriomas; and explanation and defense of Sampson's theory of pathogenesis.

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Nap 2012 pathogenesis

Nap AW. Theories on the Pathogenesis of Endometriosis. in Giudice LC, Evers JLH, Healy DL. (eds), Endometriosis: Science and Practice. 2012, John Wiley & Sons Publishers. Kindle Edition. doi: 10.1002/9781444398519.ch5

The concept of intermittent occurrence of endometriosis was suggested in 1953 by Scott: "*If serial sections of all pelvic tissue were feasible, might not all 40-year-old women with patent tubes and normal menstrual cycles, regardless of parity, reveal some endometriosis?*" The earliest theories were in situ theories based on either remnants of Wolffian or Müllerian ducts or from metaplasia of peritoneal or ovarian tissue. Coelomic metaplasia suggests that the germinal epithelium of the ovary in the serosa of the peritoneum can be transformed into endometriosis by metaplasia. These metaplastic changes occur secondary to inflammatory process or hormonal influence. The theory of induction is an extension of coelomic metaplasia and proposes that one of several endogenous, biochemical immunologic factors can induce endometrial differentiation and undifferentiated cells. The most popular theory is Sampson's retrograde menstruation theory.

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Nezhat 2012 ancient disease

Nezhat C, Nezhat F, Nezhat C. Endometriosis: ancient disease, ancient treatments. Fertil Steril. 2012, 98(6 Suppl):S1-62. doi: 10.1016/j.fertnstert.2012.08.001. Epub 2012 Oct 17. PMID: 23084567.
https://www.fertstert.org/article/S0015-0282(12)01955-3/fulltext

Nezhat discusses Sampson as the ''*father of endometriosis*."

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Redwine 2012 Googling Endometriosis

Redwine, DB. Googling Endometriosis - The Lost Centuries. © David B. Redwine, M.D., 2012, revision 2016,
http://www.endopaedia.info/

Redwine considers Sampson's theory to be flawed. Two previous publications in 1988 and 2002 are reviewed in this file. In addition to his theory of Mülleriosis, he believes that mesoderm in the endothelium can undergo metaplasia into endometriosis.

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Batt 2013 Müllerianosis

Batt RE, Yeh J. Müllerianosis: four developmental (embryonic) Müllerian diseases. Reprod Sci. 2013 Sep;20(9):1030-7. doi: 10.1177/1933719112472736, PMID: 23314961

Batt's theory of Müllerianosis predicts that embryonic Müllerian tissue, misplaced during organogenesis, results in the formation of four benign Müllerian diseases- developmental adenomyosis, endometriosis, endosalpingiosis, and endocervicosis- that will be identified in human female fetuses, infants, children, adolescents, and adults. The four developmental Müllerian diseases complement the four acquired Müllerian diseases

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Yovich 2020 Sampson pathogenesis

Yovich JL, Rowlands PK, Lingham S, Sillender M, Srinivasan S. Pathogenesis of endometriosis: Look no further than John Sampson. Reprod Biomed Online. 2020, 40(1):7-11, doi: 10.1016/j.rbmo.2019.10.007. PMID: 31836436.
https://doi.org/10.1016/j.rbmo.2019.10.007
Retrograde menstruation via the fallopian tubes fails to explain many types of endometriosis, particularly that located in extra-pelvic sites. Sampson's 1911 and 1912 publications on radiographic studies examining the unique uterine vasculature are important in investigations of lymphatic and vascular dissemination.

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Yovich 2020 history preceding Sampson MJOG

Yovich JL. The history of endometriosis preceding Sampson. Med J Obstet Gynaecol. 2020, 8(1): 1131, Open access:
https://www.researchgate.net/publication/341606942
Discusses Rokitansky (1860) when he described three phenotypes. The defining of adenomyosis, then endometriosis improved with ensuing pathologists providing better descriptions brought about by the addition of improved microscopy for histological examinations introduced by Rudolf Virchow, Hans Chiari and Friederich von Recklinghausen, as well as advanced tissue specimen preparation, especially using the microtome with diamond cutting blades, used by William Welch, Robert Myer and Thomas Cullen at the Johns Hopkins Hospital in Baltimore, USA.

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Yovich 2020 understanding Sampson personal MJOG

Yovich JL. Understanding Endometriosis: Clarifying Sampson's Theories with a Personal Perspective. Med J Obstet Gynecol. 2020, 8(1): 1130. Open access:
https://www.researchgate.net/publication/341592637
Table 3 describes common (4) and uncommon (5) sites of endometriosis, with pathogenic mechanism from which they may be derived. S1 refers to spread via the uterine veins; S2 refers to retrograde menstruation and implantation; S3 refers to metaplasia of coelomic epithelium or from Müllerian rests

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End